Ontario

Green Facts

March 2000

Environment topics at a glance

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Ontario's Smog Problem

Smog may cause health problems, especially for children, the elderly and people with respiratory and heart conditions. Much of the pollution that contributes to the formation of smog in southern Ontario comes from the United States. A major domestic source is vehicle emissions. The Drive Clean program, which requires vehicle emissions testing, is one of a number of measures the province is taking to combat smog.

The word smog was coined to describe the combination of smoke and fog during a particularly severe episode in London, England. The smog we experience here in Ontario is different, being composed largely of ozone and fine particles.

Ozone is created when nitrogen oxides (NO_x) and volatile organic compounds (VOCs) combine in the presence of sunlight. Plenty of sunlight is needed to create smog, which is why we get more of it in summer than in winter.

Fine particles – the other major component of smog – are emitted directly into the air from many sources. They are also formed in the atmosphere from the chemical reaction of gaseous pollutants. Airborne particles come in many sizes. Inhalable particles (PM_{10}) are less than 10 microns in diameter. Respirable particles ($PM_{2.5}$) are less than 2.5 microns – small enough to get deep into our respiratory systems.

Smog and our health

Children are affected by smog more than adults. They often play vigorously outdoors and, as they need more oxygen for their size, they breathe faster. Their small airways can become constricted or irritated by particles and ozone in the air. The risk to their health may also be compounded because their immune systems are not fully developed.

Elderly people and people with respiratory or heart conditions, asthma or emphysema are also vulnerable to the effects of smog.

Health Canada found an increase in ground-level ozone of 50 parts per billion was associated with a five per cent increase in hospital admissions of people suffering from respiratory ailments. Admissions for infants increased 15 per cent. Even at low levels, ozone can cause breathing problems for some people.

Exposure to fine particles in the air has also been linked to an increase in hospital admissions due to heart problems.

When high ozone levels are expected, the federal and provincial environment ministries jointly issue an air quality advisory encouraging people to avoid activities that contribute to pollution and to stay indoors if they have respiratory problems. The advisories alert people who might be affected by smog, but they are not a solution.

To reduce smog, we must reduce emissions of nitrogen oxides, volatile organic compounds, particles and the gases that produce fine particles.

Vehicles a major cause

About half of the NO_x and VOCs that form smog in southern Ontario originates in the United States Midwest and is carried by winds through the Ohio Valley.

Here in Ontario, the largest single domestic source of smog is vehicle emissions. About 40 per cent of ozone-forming nitrogen oxides come from cars, trucks and buses. Improvements in the design of vehicle exhaust systems have reduced pollution from individual vehicles. However, total emissions are expected to increase because of the growing number of vehicles on the road.

Poorly maintained vehicles also contribute to pollution. Ontario's Drive Clean program will address this problem through mandatory testing of vehicle emissions. Vehicles that fail to meet emissions requirements must be repaired or they will not be allowed on the road.

NO_x and VOCs are also emitted by many industrial processes, including refining, smelting and fossil-fuelled power generation. Solvents and coatings used in industrial processes produce smog-forming emissions, as do many cleaning products, paints, pesticides, herbicides and fertilizers used in and around the home. Adding to the load are VOCs given off naturally by vegetation.

Fine particles get into the air from agricultural activities, road dust, construction sites, forest fires, power plants, industrial processes and vehicle emission, particularly from diesel engines. They can also be formed in the atmosphere by the chemical reaction of gaseous pollutants, such as sulphates from sulphur dioxide, nitrates from nitrogen oxides and organic particles from volatile organic compounds. Once in the air, they can be carried great distances by winds.

Taking action

Ontario is doing its part by introducing new initiatives to protect and enhance air quality and by enforcing the province's air quality regulations. The Ministry of the Environment uses regulations, standards and approvals to limit industrial emissions. Achieving the government's clean air targets requires province-wide action and the involvement of people, govemment and businesses in all sectors. Voluntary measures by industry, such as the adoption of codes and management practices, are also helping prevent and reduce air pollution.

Emissions from the United States, Michigan in particular – account for more than half of Ontario's smog. Ontario has been lobbying for emission reductions south of the border. Recently, Ontario Environment Minister Tony Clement went to Washington to present Ontario's concerns.

Ontario initiatives to protect and enhance air quality

The Ministry of the Environment announced in January, 2000 that it is enacting strong measures to reduce emissions of the pollutants that cause smog, acid rain and climate change from all sectors in Ontario. These will require mandatory reporting of emissions of oxides of nitrogen (NO_x), sulphur dioxide (SO_2) and a variety of other substances of concern such as mercury (Hg) and carbon dioxide (CO_2). The electricity sector will be the first to implement monitoring and reporting requirements. All major air pollution sources in the industrial, commercial, institutional and municipal sectors will follow. New tools, including emissions caps and emissions reduction trading, will help all industrial, commercial, municipal and institutional sources meet solid pollution reduction targets in an expedient and cost effective manner.

These new air pollution reduction measures build on existing initiatives to improve Ontario air quality, including Drive Clean, the Smog Patrol, Ontario's court intervention to uphold U.S. pollution control measures and the Anti-Smog Action Plan.

Emission caps

The government will introduce lower regulated limits — also called caps — for air emissions of NO_x and SO_2. The new limits will begin January 1,2001 for the province's electricity sector and will be expanded to cover emitters in other major sectors of the province.

Commitment to meet or exceed U.S. EPA emission standards

Ontario is committed to meet or exceed U.S. Environmental Protection Agency air emission standards for electrical utilities, and will modify its regulations accordingly when new EPA standards are implemented, if the adoption of those standards will result in lower emissions in Ontario.

Emissions reduction trading

The Ministry of the Environment is proposing the use of an emissions reduction trading system to give companies flexibility to help them attain emissions reduction targets in an expedient and cost effective way. Emissions reduction trading provides an incentive for companies to make greater reductions in pollution.

Provincial emission performance standards

The government is developing emission performance standards that will be applied to all fossil-fuelled generators, no matter where they are located, that produce electricity for customers in Ontario. In this way, the government will ensure that even imported electricity used in Ontario is produced in compliance with the province's tough new emissions standards.

Drive Clean

Drive Clean, one of the most comprehensive emission-testing programs in North America, will reduce smog-causing pollutants from vehicles in the program area by 22 per cent when fully implemented. In its first year of operation, Drive Clean achieved an estimated 6.7 per cent reduction in smog-causing pollutants. About 84 per cent of light-duty vehicles passed the emissions test on their first try. Vehicles that failed their first emissions test were required to make repairs that reduced the smog-causing pollutants they emitted.

Emissions testing and repair under the Drive Clean program started in January 1999 in the Greater Toronto Area and Hamilton-Wentworth, and on April 1, 1999 became a mandatory requirement for vehicle registration and ownership transfer. When fully implemented by 2004, the program will require emissions tests for 5.2 million light-duty vehicles and 200,000 heavy-duty vehicles across most of southern Ontario.

As of January 15, 2000 compliance with the emissions testing requirement for heavy duty trucks and buses will be actively enforced by Ministry of the Environment enforcement staff, who will be working with the Ministry of Transportation.

Smog patrol

Smog Patrol, the on-road enforcement component of Drive Clean, spot-checks trucks, buses and lightduty vehicles that are gross emitters of smog-causing pollutants.

Anti-Smog Action Plan

A partnership between government, business and other organizations has developed an Anti-Smog Action Plan aimed at lowering emissions of NO_x and VOCs by 45 per cent of 1990 levels by the year 2015. Participants in Ontario's Anti-Smog Action Plan have already identified actions they can take to cut emissions of NO_x by 35 per cent and VOCs by 25 per cent.

Canada-Wide Acid Rain Strategy for Post 2000

The government has set a target of reducing total SO_2 emissions by 50 per cent by 2015 as part of its contribution beyond the Countdown Acid Rain cap.

Improved Air Quality Standards

The development of 145 human health and environmental air standards is the first major overhaul of air standards in Ontario in more than 20 years.

Air monitoring network

A $5 million upgrade to our air monitoring network includes the complete overhaul of existing air monitoring stations; the addition of new provincial sites; technological improvements to the Air Quality Index (AQI) data system for better real-time tracking and reporting; and increased capabilities for our mobile air monitoring vehicles.

Other action taken by Ontario

Other important Ontario government air quality initiatives include:

- reducing volatility levels in all gasoline sold in Ontario during the summer
- introducing tough new emissions standards that cover all large commercial and industrial boilers in the province
- working with the federal government, other provinces and stakeholders to develop Canada-wide standards for ozone and particulate matter
- promoting greater awareness of air quality issues and the potential for individual action, through programs such Partners in Air
- ensuring a voice for Ontario before a U.S. court as part of a legal action which seeks to reduce transboundary pollution, including that entering Ontario, from sources in the U.S.

Some things you can do to reduce smog

- Reduce on vehicle use by walking, biking, using public transit and car pooling.
- Keep your vehicle well tuned for good fuel efficiency and fewer harmful emissions.
- Use high octane unleaded gas in your vehicle. Premium quality gasoline produces less sulphur than the regular brands.
- Conserve energy at home and at work by using energy-efficient appliances, turning off lights and using less air conditioning.
- Avoid using gas-powered machines such as lawnmowers and leaf-blowers.
- Use latex paints and solvents that are low in VOCs.
- Plant trees to give shade in the summertime, reducing the need for air conditioning.
- Get involved in activities in your community that will improve air quality.

For more information on Ontario's smog problem and other topics, please contact:

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